Proposed Agreement between California Energy Commission and The Regents of the University of California, - CIEE

Title: Smart Grid Research Development and Demonstration Assessment
Amount: $300,000.00
Term: 12 months
Contact: Pedro Gomez
Committee Meeting:

Funding

FY	Program	Area	Initiative	Budget	This Project	Remaining Balance	
09	Electric	ETSI	Smart Grid	$1,796,449	$300,000	$5,702	0%

Recommendation

Approve this agreement with The Regents of the University of California, - CIEE for $300,000.00 to track the progress and assess the U.S. Department of Energy (DOE) American Recovery and Reinvestment Act (ARRA) Smart Grid Demonstration (SGD) Program (DE-FOA-0000036) and Smart Grid Investment Grant (SGIG) Program (DE-FOA-0000058) Projects. The length of this agreement is 26 months. Staff recommends placing this item on the discussion agenda of the Commission Business Meeting.

Issue

The DOE awarded or will be awarding dozens of ARRA SGD and SGIG projects. These projects will be conducted by a multitude of private companies, research organizations, higher education institutions, and electric utilities in numerous states across the country. There is a need to track the progress and access the results of the projects to better understand the effectiveness and impact of the projects from the perspective of the potential benefits to California.

Background

Under the U.S. Federal Government ARRA of 2009, the DOE is funding smart grid research across the country. The SGIG Program (DE-FOA-0000058) is accelerating the transformation of the electric transmission and distribution systems by promoting investments in smart grid technologies, tools, and techniques for immediate commercial use. The goals of the program involve accelerating progress toward a grid that:

- Enables informed participation by consumers in retail and wholesale electricity markets
- Accommodates all types of central and distributed electric generation and storage options
- Enables new products, services, and markets
- Provides for power quality for a range of needs by all types of consumers
- Optimizes asset utilization and operating efficiency of the electric power system
- Anticipates and responds to system disturbances
- Operates resiliently to attacks and natural disasters.

In addition, the SGD Program (DE-FOA-0000036) is comprised of regional demonstration projects and utility-scale energy storage projects.

In the regional studies, project teams verify smart grid technology viability, quantify costs and benefits, and validate new business models that can later be adapted and replicated around the country. The goal of these projects is to provide the information necessary to enable customers, electricity distributors, and electricity generators to change their behavior to reduce electric power system demands and costs, increase energy efficiency, match electricity demand and resources, and increase the reliability of the grid.

In the energy storage projects, teams are working toward advancements in grid-scale energy storage. Electric power system operators can use electricity storage devices to manage the amount of power required to supply customers at times when the need is greatest, which is during peak load. In addition, energy storage devices can:

- Make renewable energy resources, whose power output cannot be controlled by grid operators, more manageable.
- Balance microgrids to achieve a good match between generation and load.
- Provide frequency regulation to maintain the balance between the network's load and power generated.
- Enable deferrment of transmission and distribution investments.
- Provide a more reliable power supply for high-tech industrial facilities.

Proposed Work

This proposed research will track the progress and assess the DOE ARRA SGD Program and SGIG Program (DE-FOA-0000058) Projects. The project will determine the technological and interoperability issues that were encountered in the smart grid projects. A few of the issues to be investigated include:

- Are there projects that are related and are there projects that are redundant?
- What are the potential benefits and costs of the new technologies being introduced or demonstrated?
- What is the potential for work force development?

What are the barriers to the adoption potential of the new technologies?
What are the key issues with regard to standards, interoperability, security, and privacy?

- Do the new technologies integrate with existing utility systems?
- Ascertain and catalog potential gaps in smart grid research. Are there benefits to California for additional research to fill the gaps?
- What projects conducted outside of California are beneficial to California's energy and environmental policy goals? What are the best practices that could be learned and transferred from those projects?
- Should additional research be proposed on projects that help California achieve its energy and environmental policy goals?

Justification and Goals

This project "[has] the potential to enhance transmission and distribution capabilities" (Public Resources Code 25620.1.(c)(3)).

This will be accomplished by:

- Developing conclusions and recommendations to the Energy Commission that will accelerate and enhance smart grid efforts in California and help with achieving the State's energy and environmental policies
- Estimating the societal benefits of the smart grid technologies
- Assessing the smart grid projects for technological and interoperability issues
- Track the progress of the smart grid projects and continually update the database
- Developing a publicly accessible user-friendly website and database that categorize Smart grid project metrics and parameters
- Establishing a set of metrics to measure the progress, success, and impact of the various ARRA Smart Grid projects